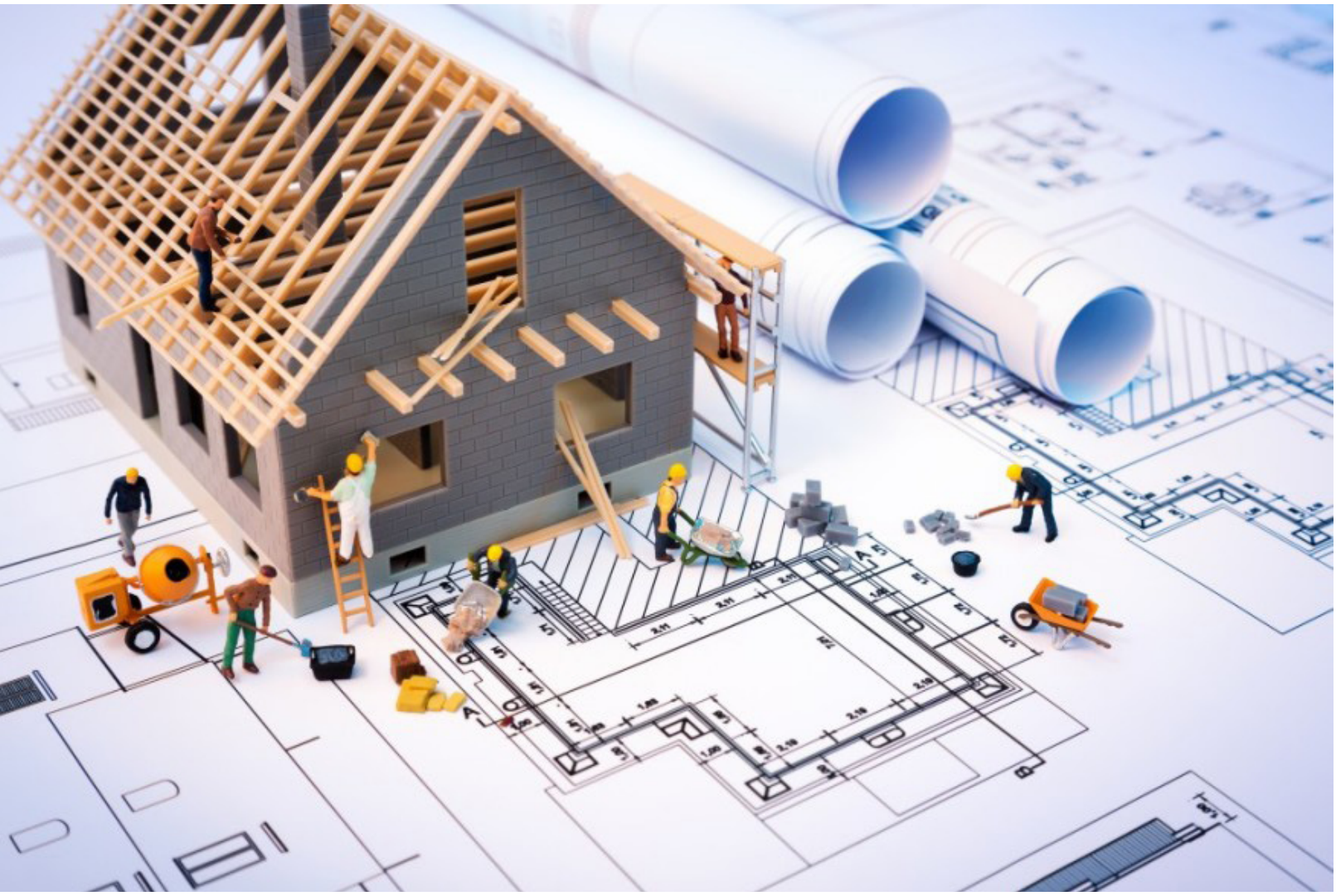


The Building Envelope:

A Home's Main Defense

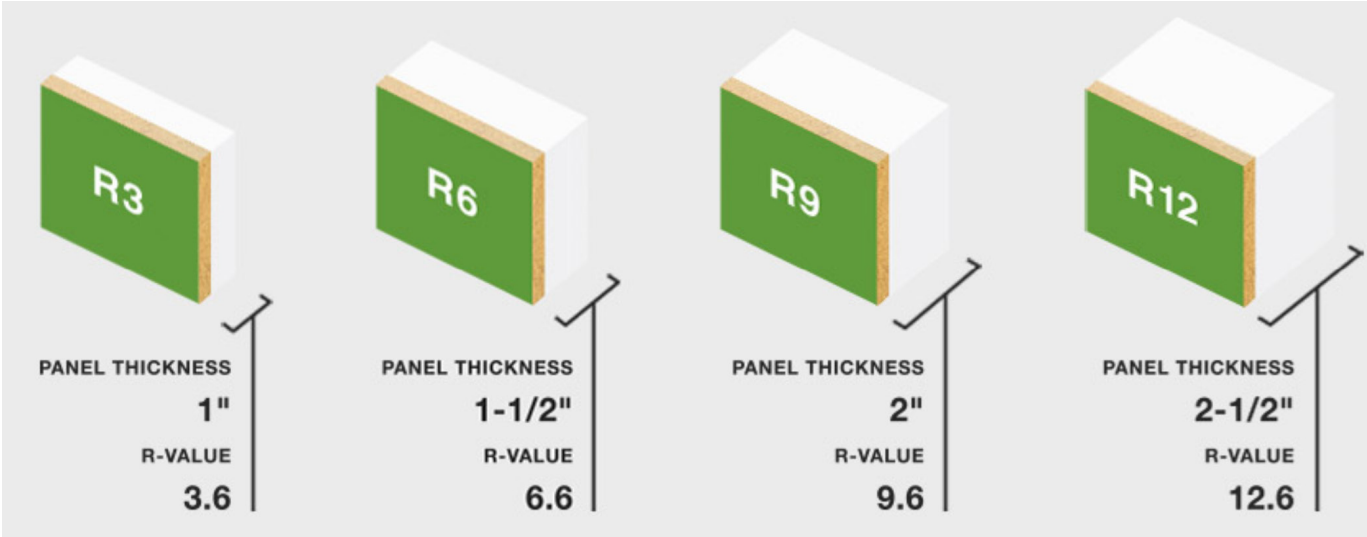
TIM,
Why do some homes encounter moisture related issues such as rot, leaks, mold etc. while other homes never seem to succumb to nasty moisture ailments?

There is more to the exterior design of a home than just a pretty façade. In resilient, comfortable, high-performance residential projects, design of the building envelope is the homes – and its occupants- primary defense against unnecessary moisture and comfort related failures.

Given the issues of building resilience, durability, design, and client comfort, some builders are leaning on new performance standards to create high-performance home exteriors. It all starts with understanding a few important principles.

ADDRESSING CONDENSATION ISSUES

Many folks attribute moisture issues with rainwater. But from attic rain (water droplets that form on rafters inside the attic) up north to wet wall insulation in humid climates , builders are becoming more aware of another kind of water intrusion: condensa-



tion. Opposing exterior and interior temperatures create condensation where cold, warmth, and humidity meet, which turns vapor into droplets. Depending on the outside temperature, temperature difference, and relative humidity, these droplets may form on the siding, on the water-resistive barrier, on back of the plywood, on the studs, and even on the drywall.

Two primary defenses against condensation are:

1) Limit the amount of humid air inside the building assembly. This is typically done with good air sealing; air leaks carry far more humid air into the building assembly than vapor diffusion.

2) Raise the temperature of the building assembly to keep materials above the dew point temperature. This is increasingly done using continuous exterior insulation, which greatly improves overall thermal performance and relocates the dew point condensation away from the wall cavity.

COMBINING CONDENSATION CONTROL AND BULK WATER CONTROL

Condensation in walls can be devastating, but by far the most common failure mechanism is exterior water seeping into walls through the exterior cladding such as siding or brick (yes, brick leaks – a lot-). The best way to keep rainwater from soaking the home interior is by creating dimensional separation. This necessary disconnect can be achieved in a variety of ways.

Adding .5 inch to 1.5 inches of foam to the exterior of the wall system, or using a foam-sheathing combination (sometimes referred to as "structural insulation") is a great way to build in a rainscreen adding a robust, high-performance, thermally broken building enclosure, solving for both condensation control and water control.

When I began building homes 30+ years ago, most had never heard of building science. Fast forward to today, and universities are offering degrees specializing in building science. The pace of improvement in the building industry is increasing on a seemingly exponential trajectory.

Hiring a well-trained building professional has never been more important that in today's fast paced environment. A builder with a thorough understanding of building science can offer high-performance, ultra-comfortable homes that keep the elements outside where they belong and durability that serves you and your family for many years to come. **BG**

CERTIFIED GREEN PROFESSIONAL™

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